

REMARKS

The indication that claim 17 is objected to and allowable when written in independent form is acknowledged. By the present amendment, claim 17 has been retained in dependent form, and amended to delete a feature which has been recited in new dependent claim 18.

The Examiner, Ms. Lea-Edmonds, is thanked for the courtesy extended applicants' representatives during the interview of July 15, 2003, during which time proposed amendments to the claims and new claims were discussed, as noted in the Interview Summary. At the interview, differences between the claimed invention and the cited art were pointed out and the Examiner indicated that the claims will be considered in light of the arguments presented, which are generally set forth below.

By the present amendment, claim 14 has been amended in a manner which is considered to overcome the rejection thereof under 35 U.S.C. §112, second paragraph, in now reciting reciprocal movement of a member in said pump. Accordingly, the insufficient antecedent basis should now be overcome.

With regard to the drawing objection in that the accumulator being mounted on the display device must be shown or the feature canceled from the claim, by the present amendment, claim 11 which recited the feature of the accumulator being mounted on the display device has been canceled without prejudice or disclaimer of the subject matter thereof, so as to avoid illustration of such feature. Accordingly, the drawing objection should now be overcome.

As to the rejection of claims 1-10, 12, 13, 15 and 16 under 35 U.S.C. 103(a) as being obvious over Ohashi et al (5,646,824) and the rejection of claim 11 under 35 U.S.C. 103(a) as being unpatentable over Ohashi et al in view of Nogami et al as applied to the claims above, and further in view of Nakagawa et al (6,519,148), such rejections are traversed insofar as the rejections are properly applicable to the claimed invention, and reconsideration and withdrawal of the rejections are respectfully requested.

At the outset, applicants note that the Examiner apparently contends that claims other than claim 11 stand rejected over Ohashi et al in view of Nogami et al, but applicants note that while the Examiner refers to Nogami et al (4,810,168) at page 3 of the Office Action, Nogami et al does not appear in the statement of the rejection of claims 1-10, 12, 13, 15 and 16. As such, it is not considered necessary to comment with respect to such patent in relation to the claimed invention and reference is made to In re Hoch, 166 USPQ 406, 57 CCPA 1292 (1970), in relation to the requirement to properly set forth a rejection of the claims over cited art.

With regard to the requirements to support a rejection under 35 U.S.C. 103, reference is made to the decision of In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988), wherein the court pointed out that the PTO has the burden under §103 to establish a prima facie case of obviousness and can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Furthermore, such requirements have been clarified in the recent decision of In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002) wherein the court in reversing an obviousness rejection indicated that deficiencies of the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge".

The court pointed out:

The Examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation

would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is immaterial to patentability, and could not be resolved on subjected belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. (emphasis added)

Applicants note that as discussed with the Examiner at the interview, by the present amendment, the claims have been amended to recite a heat radiation "portion" rather than a heat radiation "pipe" and to recite a "member" for circulating the cooling liquid rather than a "passage". Additionally, each of the independent claims 1, 5, 8 and 10 have been amended to recite a circulation pump for circulating cooling liquid therethrough including an input portion for receiving cooling liquid and a separate output portion for supplying cooling liquid. That is, in accordance with the present invention, a liquid cooling system is provided which is utilized in a personal computer, such as a notebook type personal computer, which is of thin construction and which enables appropriate cooling to prevent damage to semiconductor devices which are heat generating bodies in such personal computers and which enable appropriate cooling of such in an electronic device of thin construction without requirement fans or the like, while providing a long useful life. Referring to Figs. 2-9 of the drawings of this application, disclose a pump 1 through which the cooling fluid is circulated therethrough. In accordance with the present invention, a heat receiving jacket 2 is supplied with cooling liquid and positioned to receive heat generated from a heat generating body 5 represented by a semiconductor element or device forming a part of a personal computer, for example, a heat radiation portion 4 is provided for radiating heat which is applied by the cooling liquid passing through the heat receiving jacket, and a member 3 circulates the cooling liquid passing through the heat radiation portion into the pump 1. More particularly, as shown, the circulation

pump 1 is constructed with a housing having a diaphragm 8 that is mounted for reciprocal movement therein and has check valves 9a and 9b at opposite ends. As described at page 15 of the specification of this application, when the diaphragm 8 moves to the solid line position shown in the figure, the cooling liquid is suppressed, and the check valve 9b is opened and the cooling liquid moves out of the pump in the direction of the arrow. When the diaphragm comes back to the position shown by the broken line, since the pressure falls down, the check valve 9a is opened and the cooling liquid within the pipe portion 3 flows into the pump 1. Repeating this operation causes the cooling liquid to circulate in the flow passage and the pump operates as a pulsation pump in which the cooling liquid circulates therethrough being received into the pump 1 by way of the check valve 9a at the input portion thereof and being discharged from the pump 1 through the separate output portion by way of the check valve 9b.

As described in connection with Fig. 2, an expansible portion 10 is connected at the output of the pump 1, and as described in the paragraph bridging pages 15 and 16 of the specification, in accordance with the present invention, if the volume changed due to the reciprocal movement of the pump member is ΔV_p , the pressure occurring in response to the volume change ΔV_p is P , the volume change of the expansible portion 10 when the pressure P is applied is ΔV_s , then ΔV_s is larger than ΔV_p and in this manner, it is possible to achieve the characteristics of performance of the liquid cooling system with high efficiency, thereby to construct a system of low electric power consumption. Applicants submit that the aforementioned features are clearly set forth in the independent and dependent claims of this application, and such features are not disclosed or taught in the cited art.

Applicants note that as more clearly illustrated in the figures, an accumulator is provided in the liquid cooling system and as shown in Fig. 4, for example, the accumulator 13 is provided between an output of the pump 1 and an input of the heat receiving jacket 2 and includes a supply opening for supplying the circulating

cooling liquid therethrough and a discharge opening for discharging the cooling liquid therethrough as well as a chamber. It is noted that this arrangement provides for a series connection of the accumulator and in accordance with the present invention, the volume change of the accumulator is ΔV_s , which is caused when the pressure P is applied thereto, and ΔV_s is equal to or greater than ΔV_p as described at pages 17 and 18 of the specification, for example. Applicants note that such features are also set forth in the claims of this application.

Turning to the Examiner's rejection of the claims based upon Ohashi et al, noting that Ohashi is a common inventor in this application, as well as the inventor who attended the interview, the Examiner contends that Ohashi et al teaches a liquid cooling system comprising a pump 41 and other features, with the Examiner recognizing that Ohashi et al lacks the teaching of a pump being of the pulsation type and the use of a plurality of pumps as claimed. As recognized by the Examiner, Ohashi et al fails to disclose or teach the aforementioned claimed features, and applicants further submit that the pump 41 of Ohashi et al is not disclosed to be a circulation pump, whether or not of the pulsation type, for circulating cooling liquid therethrough including an input portion for receiving cooling liquid and a separate output portion for supplying cooling liquid as now recited in each of the independent claims of this application. In accordance with the present invention, the cooling liquid circulates within a closed flow passage in which the circulation pump is serially connected so as to provide separate input portion and a separate output portion and applicants submit that Ohashi et al does not disclose or teach the aforementioned recited features in the sense of 35 U.S.C. 103. Accordingly, applicants submit that all claims patentably distinguish over Ohashi et al with respect to this feature alone and all claims should be considered allowable thereover.

Applicants note that independent claims 1 and 5 further recite the feature of " ΔV_s is equal to or greater than ΔV_p , with the inner volume change when said pump emits (a pulsation therefrom as recited in claim 1) or (the cooling liquid therefrom as

recited in claim 5) being represented by ΔV_p , the pressure caused by said volume change being represented by P, and the volume change due to said pressure P which occurs in the flow passage of the cooling liquid, other than in said pump, being represented by ΔV_s ". The Examiner contends that such feature is inherent in Ohashi et al, and applicants submit that the Examiner's position is improper. More particularly, claim 1 which recites that the pump emits a pulsation therefrom, as recognized by the Examiner is not disclosed or taught by Ohashi et al. Furthermore, as to the relationship defined and the question of "inherency", reference is made to the decision of In re Robertson, 49 USPQ 2d 1949 (Fed. Cir. 1999), wherein the court pointed out that anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. As noted by the court, if the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if the element is "inherent" in its disclosure. To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Moreover, the court pointed out that inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Applicants submit that the Examiner has failed to show the claimed relationship as being provided by the pump 41 of Ohashi et al in the sense of 35 U.S.C. 102 or 35 U.S.C. 103. Thus, at least claims 1 and 5 and the dependent claims further patentably distinguish over Ohashi et al in relation to the aforementioned features.

Applicants note that the Examiner in setting forth the basis for the stated rejection which is based solely on Ohashi et al, indicates at page 3 of the Office Action that "Nogami et al (4810168) is relied upon for its teaching of the pump (10) being of the pulsation type as claimed. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to use the pulsation type pump to aid in regulating the cooling liquid. With respect to the number of pumps used, it would have been obvious to one of ordinary skill in the art to use a plurality of pumps, ...". As pointed out above, Nogami et al has not been utilized in the statement of the rejection. Moreover, applicants note that while the Examiner refers to the pump 10 of Nogami et al, applicants note that it is not seen that the pump 10, whatever its construction, is of a circulating pump arranged in a closed flow passage in which the pump circulates the circulating liquid therethrough and has separate input and output portions in the manner defined. Thus, the Examiner's position concerning Nogami et al represents a hindsight reconstruction attempt in complete disregard of the teachings of Ohashi et al and fails to provide the claimed features as recited, noting that this position represents the principle of "obvious to try" which is not the standard of 35 U.S.C. 103. See In re Fine, supra. Furthermore, applicants submit that Nogami et al also fails to disclose the claimed relationship which is not disclosed by Ohashi et al nor the provision of the plurality of pumps and it is improper to contend that these features are present in the sense of 35 U.S.C. 103. Thus, applicants submit that claims 1 and 5 and the dependent claims patentably distinguish over this proposed combination of references.

Applicants note that independent claims 8 and 10 recite an accumulator having a supply opening for supplying the circulated cooling liquid therethrough, a discharge opening for discharging the cooling liquid therethrough and a chamber for maintaining gas and the cooling liquid therein. Claim 8 further defines the feature that the accumulator is connected to the closed flow passage and that the amount of the cooling liquid maintained within the accumulator changes in response to emission of the cooling liquid from the pump, while claim 10 recites the feature of a passage for circulating cooling liquid passing through the heat radiation pipe into the pump so that the cooling liquid circulates within a closed flow passage, and that the amount of cooling liquid maintained within the accumulator changes in response to

emission of the cooling liquid from the pump. Although the Examiner refers to an accumulator 50 in Ohashi et al, it is readily apparent that assuming that the bellows 50 of Ohashi et al, if considered an accumulator, is not connected in the manner defined nor does such bellows have supply and discharge openings in the manner defined and operating in the manner set forth. Thus, applicants note that independent claims 8 and 10 and the dependent claims patentably distinguish over the cited art in the sense of 35 U.S.C. 103, and should be considered allowable thereover.

Applicants note that new independent claim 19 is patterned after the features of the aforementioned independent claims and recites a circulation pump for circulating cooling liquid therethrough including an input portion for receiving cooling liquid and a separate output portion for supplying cooling liquid, a member for circulating the cooling liquid passing through said heat radiation portion into said pump so that said cooling liquid circulates within a closed flow passage and an accumulator disposed along said closed flow passage, which features are not disclosed or taught in the cited art as discussed above. Thus, applicants submit that new independent claim 19 and the dependent claims patentably distinguish over the cited art in the sense of 35 U.S.C. 103 and should be considered allowable thereover.

With respect to the dependent claims, applicants note that the claims which depend from each of independent claims 1, 5, 8, 10 and 19 recite further features concerning the pump and accumulator and/or other features which are not disclosed or taught in the cited art, and patentably distinguish over the cited art for the reasons given above. Accordingly, applicants submit that the dependent claims also patentably distinguish over the cited art and should be considered allowable at this time.

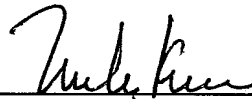
Applicants note that although the Examiner utilized Nakagawa et al (6,519,148) in relation to claim 11, Nakagawara et al is relied upon for its teaching of

an accumulator (15) being mounted on the display device (2) and applicants note that claim 11 and the recited feature has been canceled, such that it is apparent that Nakagawa et al does not overcome the deficiencies of the cited art as described above. Accordingly, further discussion concerning this reference is considered unnecessary.

In view of the above amendments and remarks, applicants submit that all claims present in this application patentably distinguish over the cited art and should now be in condition for allowance. Accordingly, issuance of an action of a favorable nature is courteously solicited.

To the extent necessary, applicant's petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (520.40466X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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